

## Wireless Instant Messaging Strategic Portfolio Development



Committee Review  
Submitted Pursuant To  
Employment Agreement



Rev. 0.1 12/13/99

Intellectual Property Dept. Use Only	
Discl. #	PF218-INTI
Discl. Date Committee Action	

**THIS SECTION TO BE COMPLETED BY INVENTOR(S)**

(Additional info on most questions is in the Status Bar at the bottom of the window.)

(TAB &amp; Shift-TAB(to back up) thru the fields to enter data.)

1. Name of Invention: (Please limit to 10 words or less.) **IMPROVED MESSAGE ORDERING IN CHAT SESSIONS**
2. Documentation Date: **THIS DISCLOSURE**  
(Attach log sheets, drawings, etc., to support the earliest date you documented your idea.)
3. Whom did you first tell about your invention?  
Name: **CRISTINA RIVERON** Date:
4. Is this disclosure being submitted as an Ornamental Design Disclosure? Yes/No **NO**  
If YES, please attach a completed Ornamental Design Disclosure Form along with this disclosure.
5. What problem is solved by this invention? (Attach additional sheets if necessary.) **DIFFERING RESPONSE TIMES BY CHAT PARTICIPANTS/CLIENTS CAN CREATE A CONFUSING USER EXPERIENCE. SEE ATTACHED.**
6. Identify related technology. (Attach additional sheets if necessary.) **MESSAGE SORTING, PRESENTING AND CROSS-REFERENCING IN MICROSOFT OUTLOOK.**
7. Describe the invention, and how it solves the problem(s) in a way not accomplished before. Attach additional sheets describing the invention in detail. **THIS INVENTION IMPROVES THE CHAT USER EXPERIENCE BY INTELLIGENTLY PRESENTING, TAGGING AND/OR REORDERING MESSAGES FROM SLOW PARTICIPANTS. SEE ATTACHED.**

**THIS SECTION TO BE COMPLETED BY ENGINEERING MGR OR HIGHER**

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1. Product invention is to be used on. (If a process, name the 1<sup>st</sup> product the process is to be used on.) **WIRELESS DEVICES WITH INSTANT MESSAGING OR CHAT CAPABILITY**
2. This product will be(has been) offered for sale, quoted to a customer, or shipped. Yes/No **NO** If YES, indicate the earliest date any of these will (have) occur(red).

3. This invention is to be(has been) disclosed outside Motorola: Yes/No **NO**  
If YES, indicate the date and the other party.
4. Was a non-disclosure agreement in place covering the admitted disclosure? Yes/No
5. Name of Engineering Manager (or higher) who attests to the accuracy of this section:  
Typed: **Garland Phillips**  
Phone: **52355** Signature: *[Signature]* Date: \_\_\_\_\_

**ALL BLANKS MUST BE COMPLETED AND ALL ADDITIONAL SHEETS MUST BE  
SIGNED & DATED BY ALL INVENTORS AND TWO WITNESSES.**

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 (TAB & Shift-TAB(to back up) thru the fields to enter data.)

**Primary Inventor:****THOMSEN**

Last Name:

**SOEREN**

First Name:

**HENRIK**

Middle Name:

Social

**328868536**

Security #

Commerce

**10028764**

ID #

**6549 GLENVIEW DR 1323**

Home Address: Street;

**N RICHLAND HLS**

City;

**TX**

State;

**76180**

Zip;

**DENMK**

Citizenship:

Location

Employee

**NS504 817-245-2316**

Dept. #: Office Phone #:

**TX72**

Code:

**S147**

MailStop:

**1**

Shift:

**PERM**

Status:

**DWIGHT SMITH**

Immediate Supervisor:

INVENTOR'S FULL SIGNATURE

DATE

*Soeren Henrik Thomsen***Inventor:****TRINE**

Last Name:

**STEVEN**

First Name:

**EUGENE**

Middle Name:

Social

**045548040**

Security #

Commerce

**10002042**

ID #

**917 GREENBRIAR DR**

Home Address: Street;

**KELLER**

City;

**TX**

State;

**76248**

Zip;

**USA**

Citizenship:

Location

Employee

**NS504 817-245-2572**

Dept. #: Office Phone #:

**TX72**

Code:

**S147**

MailStop:

**1**

Shift:

**PERM**

Status:

**DWIGHT SMITH**

Immediate Supervisor:

INVENTOR'S FULL SIGNATURE

DATE

*Eugene Trine***Inventor:****MOWRY**

Last Name:

**KEVIN**

First Name:

**CURTIS**

Middle Name:

Social

**519088038**

Security #

Commerce

**10129073**

ID #

**9703 WINDY HOLLOW DRIVE**

Home Address: Street;

**IRVING**

City;

**TX**

State;

**75063**

Zip;

**USA**

Citizenship:

Location

Employee

**NS504 817-245-2695**

Dept. #: Office Phone #:

**TX72**

Code:

**S147**

MailStop:

**A**

Shift:

**FULL**

Status:

**DWIGHT SMITH**

Immediate Supervisor:

INVENTOR'S FULL SIGNATURE

DATE

*Kevin Curtis***WITNESS NAMES & SIGNATURES:**

The witnesses, in signing this form, attest to the fact that they understand the invention.

WITNESS NAME (PRINTED or TYPED)

PHONE

WITNESS SIGNATURE

DATE

*Garland Phillips**52355**[Signature]*

WITNESS NAME (PRINTED or TYPED)

PHONE

WITNESS SIGNATURE

*Jeff Coats**8172453721**[Signature]*More inventors? Click [HERE](#) to make use of the [More Inventors link](#).

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STOP TABBING NOW!!!

**Use this page and others below to add information necessary to fully describe your invention. (You may also attach other info, such as copied log book sheets, etc.)**  
**CLICK in the blank area below and add whatever info you want, just as you would in any WORD document. BUT KEEP YOUR INFO BETWEEN THE ASTERISK LINES BELOW. DO NOT ATTEMPT TO UNPROTECT THIS DOCUMENT – YOU COULD LOSE ALL THE INFORMATION YOU HAVE ENTERED.**

\*\*\*\*\* BEGIN \* ADDING \* INFO \* BELOW \*\*\*\*\*

**5. What problem is solved by this invention**

In a chat session, the contributions from different participants appear asynchronously. Differing response times by participants can create a confusing user experience when messages arrive from a "slow" participant some time after the "fast" participants have moved on to a new chat topic. This is an inherent problem if some participants are using "slow" wireless IM clients.

The following shows an example of a chat session where this problem may be present:

User1: What's your favorite movie?

User2: Gone with the wind

User3: Titanic.

User1: What's your favorite food?

User3: Pizza!!!

User4: fried green tomatoes

In the above scenario it is in general impossible to know if the message from User4 is in response to the first or second question from User1, although participants may make such assumptions based on the timeliness of earlier messages from User4 and/or based on the time differences between the arrival of the above current messages from User1 and User4. That is, if User4 usually responds quickly, and if a significant amount of time passes between the first and second question from User1, and if a significant amount of time passes between User1's second question and User4's answer, then it may be reasonable to assume that the message from User4 is in response to the second question from User1.

What is needed is a means to avoid, reduce, or highlight the occurrence of out-of-sequence messages such as the above described.

**7. Describe the invention, and how it solves the problem(s) in a way not accomplished before.**

This invention describes the means for detecting when a chat message may be out of sequence and how to use that information in the presentation or ordering of such messages in the chat window.

**Actions taken by sending IM client.**

Under this invention the information needed to detect out-of-sequence messages is generated in the IM client at the time of creation of each new, originated IM message. This information is known as the "Message Creation Reference" (MCR) in this disclosure. The MCR information is attached to each new message submitted to the IM infrastructure.

ALL Inventors and two Witnesses must SIGN & DATE all additional pages.

Shirley L. Smith, Inventor  
Ultima Eugene Grice  
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In a first solution, the originating IM client generates the Message Creation Reference without explicit assistance from the IM infrastructure. The MCR takes the form of a time stamp generated by the IM client. This time stamp would indicate the time that the user composed the message, and therefore where the message fits in the chat stream of messages.

Since it may take the user some time to compose a message, the question arises if the time stamp should relate to when the user started entering the message or to when s/he finished entering the message and submitted it to the IM system. Given a goal of detecting the user's intended context for the new message, it seems appropriate to tie the time stamp to the time when the user started entering the new message. Also, if the user decides to not send a message but instead deletes it and then starts entering another message, the MCR time stamp should reflect the time when the user started that second message. See flow diagram below.

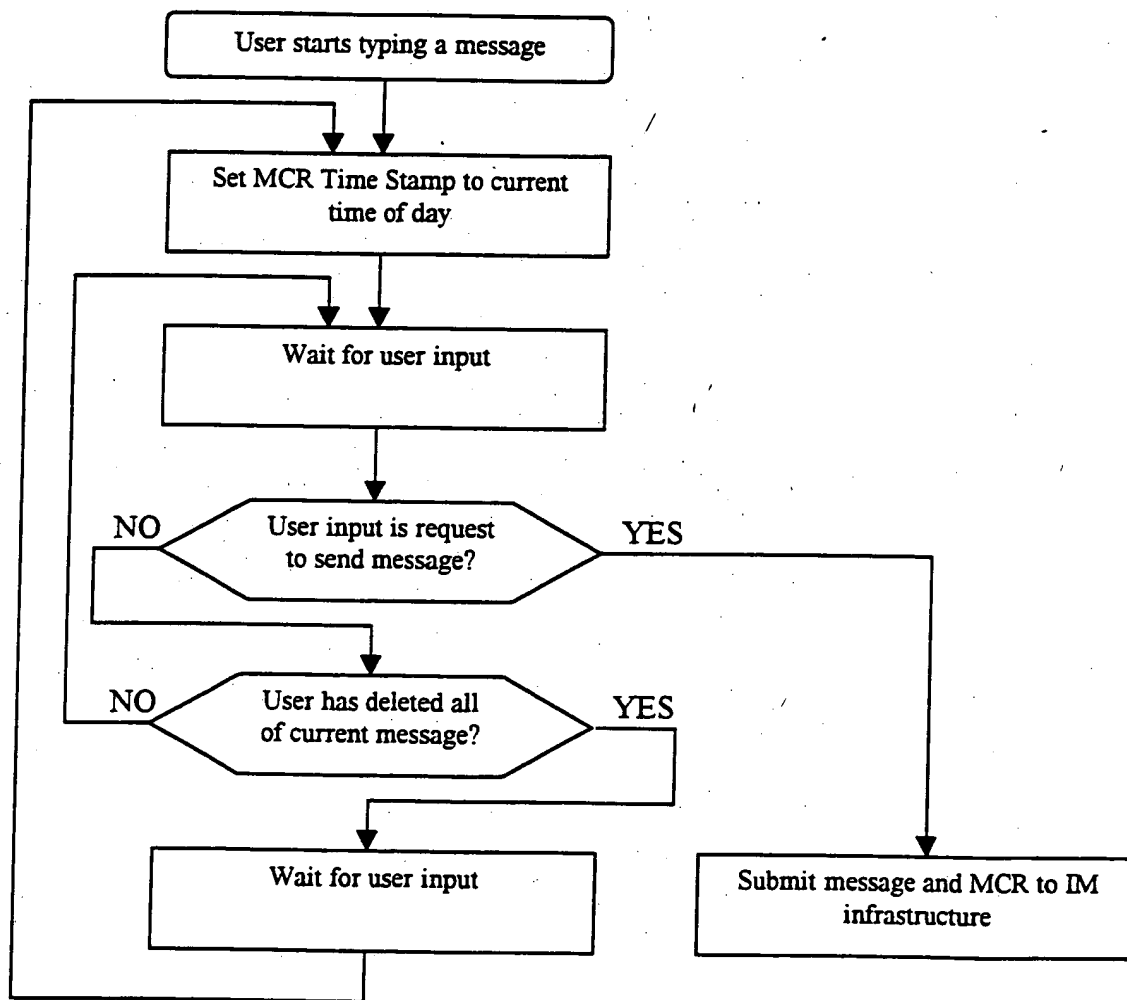


Figure 1: Sending IM client generates MCR time stamp.

In a second solution, the originating IM client still generates the Message Creation Reference without explicit assistance from the IM infrastructure. The MCR takes the form of a reference to the last IM message received by the IM client. This

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*Shirley Annade Thomas*  
*Shirley Annade Thomas*  
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MCR Message Reference may consist of a copy of the first few characters of that last message and possibly the first few characters of the corresponding sender ID. The MCR Message Reference may also include a hash value calculated from the contents of the referenced message, using a well-known hashing algorithm. This reference to the last received message indicates where the new message fits in the chat stream of messages.

In the case of automatic generation of such a reference, the above flow diagram applies also in this second solution, if "Set MCR Time Stamp to current time of day" is replaced with "Set MCR Message Reference to refer to last received IM message".

A semi-automatic generation of such a reference is also possible. In this case the user explicitly selects which previously received message shall be referred to in the MCR Message Reference.

### Actions taken by IM infrastructure.

In a third solution the IM infrastructure is explicitly involved in MCR creation as it creates a locally unique message number or message ID for each incoming message, which it then sends out along with each replicated message to the IM clients. The IM client can use this message number or message ID when it generates the MCR Message Reference contents. It should be noted that the message number or message ID is information for the IM client only and need not be displayed to the user for the purpose of creating MCR Message References.

For any of the above solutions, the IM infrastructure is required to receive the Message Creation Reference along with each new message from the originating IM client, and pass the MCR on to all the receiving IM clients along with each replicated message.

If an IM client does not provide any MCR information along with messages sent into the system, the IM infrastructure should generate an MCR Time Stamp on behalf of that IM client for messages received from that IM client. This MCR Time Stamp should be calculated as the current time of day, less the typical transport delay for messages sent from this IM client, where the typical transport delay may be a function of the type of connection used by the IM client.

### Actions taken by receiving IM client.

If a received message is not accompanied by MCR information, the receiving IM client should generate an MCR Time Stamp for each such message. This MCR Time Stamp should be calculated as the current time of day, less the typical transport delay for messages sent from the IM infrastructure to this IM client, and less the typical transport delay for messages sent into the IM infrastructure from the originating IM client, if this delay is known.

The receiving IM client may use the MCR information received along with each message when deciding how to present messages to the chat user. If a message is received out of sequence (see definitions of "out of sequence" below), the client may highlight the out-of-sequence message and/or present messages in an order consistent with the received MCR information, rather than in the order in which they were received.

The highlighting of an out-of-sequence message may take different forms depending on the capabilities of the user interface, for example the message text may be grayed out, put in italics, displayed in a unique color, displayed along with a unique icon, displayed along with the received MCR information, or displayed along with an arrow or other means to indicate where in the chat stream the out-of-sequence message fits according to its MCR information.

**Example. The message from User4 was received out-of-sequence and is highlighted by the receiving IM client:**

User1: What's your favorite movie?

User2: Gone with the wind

User3: Titanic.

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Susan D. Thomas  
Steve P. Smith  
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 <> W. A. J.  
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User1: What's your favorite food?

User3: Pizza!!!

User4: *fried green tomatoes***Definitions of out-of-sequence conditions:**

- If two received messages both contain an MCR Time Stamp, those two messages are received out-of-sequence with respect to each other if the two messages are not received in the order of their MCR Time Stamps. The receiving IM client can put such messages in an order consistent with the received MCR information by simply displaying messages in the order of their MCR Time Stamps rather than in the order of their receipt. To avoid excessive reordering of incoming messages, the receiving IM client may use a windowing function, so that messages are reordered only if the disorder is significant as measured by the difference in MCR Time Stamps compared to a set value.
- Any received message is received out-of-sequence with respect to other previously received messages, if any of those other messages have an MCR Message Reference to the just received message. The IM client may move the just received message up in the presentation order so that it appears before all messages that refer to it.
- If a received message contains an MCR Message Reference to a previously received message from e.g. User1, and that previously received message is not the latest message received from User1, the just received message is received out-of-sequence. The IM client may move the just received message up in the presentation order so that it appears AFTER the message (from User1) that it refers to, and BEFORE the next message from the same user (User1).

**Example of this last described condition:**

User1: What's your favorite movie?

User2: Gone with the wind

User3: Titanic.

User1: What's your favorite food?

User3: Pizza!!!

At this point a new message is received from User4. The message has an MCR Message Reference to the first message from User1 ("What's your favorite movie?"). Since User1 has sent another message since then, the new message from User4 is out-of-sequence. The IM client may move the message from User4 so that it appears between the two messages from User1:

User1: What's your favorite movie?

User2: Gone with the wind

User3: Titanic.

User4: *fried green tomatoes*

User1: What's your favorite food?

User3: Pizza!!!

It should be noted that any reordering done should not reorder messages that were received from the same chat user.

It may be impossible to order all messages such that they are all in order according to both all received MCR Time Stamp and all received MCR Message Reference information. The receiving IM client may indicate this condition to the chat user and make a best effort at ordering the received messages.

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*Signature of Eugene*  
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<> *Jeff* \_\_\_\_\_  
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 <> *W. A. H. I.* \_\_\_\_\_  
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